

ANALYSIS


This ordinance repeals those provisions of Title 28 – Plumbing Code of the Los Angeles County Code, which had incorporated portions of the 2010 Edition of the California Plumbing Code by reference, and replaces them with provisions incorporating by reference portions of the 2013 California Plumbing Code, published by the California Building Standards Commission, with certain changes and modifications. Unless deleted or modified herein, the previously enacted provisions of Title 28 continue in effect.

State law requires that the County's Plumbing Code impose the same requirements as are contained in the building standards published in the most recent edition of the California Plumbing Code except for changes or modifications deemed reasonably necessary by the County because of local climatic, geologic, or topographic conditions.

The changes and modifications to requirements contained in the building standards published in the 2013 California Plumbing Code which are contained in this ordinance are based upon express findings contained in the ordinance, that such changes are reasonably necessary due to local climatic, geologic, or topographic conditions.

This ordinance also makes certain modifications to the administrative provisions of Title 28.

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Requested: 08/23/13
Revised: 10/24/13

ORDINANCE NO. 2013-0050

An ordinance amending Title 28 - Plumbing Code of the Los Angeles County Code by adopting portions of the 2013 California Plumbing Code, by reference, with certain changes and modifications, and making other revisions thereto.

The Board of Supervisors of the County of Los Angeles ordains as follows:

SECTION 1. Sections 119.1.2 through 119.1.14 of Chapter 1, Chapters 2 through 16A, and Appendices A, B, D, G, I, and K, which incorporate by reference and modify portions of the 2010 California Plumbing Code, and Appendix S are hereby repealed.

SECTION 2. Chapter 1 is hereby amended to read as follows:

CHAPTER 1

ADMINISTRATION

100 ADOPTION BY REFERENCE.

Except as hereinafter changed or modified, Sections 1.2.0 through 1.14.0 of Chapter 1, Division I of that certain Plumbing Code known and designated as the ~~2010~~2013 California Plumbing Code as published by the California Building Standards Commission, are adopted by reference and incorporated into this Title 28 of the Los Angeles County Code as if fully set forth below, and shall be known as Sections 119.1.2 through 119.1.14, respectively, of Chapter 1 of Title 28 of the Los Angeles County Code.

Except as hereinafter changed or modified, Chapters 2 through ~~16A~~17 and Appendices A, B, D, ~~G, H, I, and K~~H, I, and J of that certain Plumbing Code known and

designated as the ~~2010~~2013 California Plumbing Code as published by the California Building Standards Commission, are adopted by reference and incorporated into this Title 28 of the Los Angeles County Code as if fully set forth below, and shall be known as Chapters 2 through ~~46A~~17, and Appendices A, B, D, ~~G~~, H, I, and ~~K~~ and J of Title 28 of the Los Angeles County Code.

A copy of the ~~2010~~2013 California Plumbing Code shall be at all times maintained by the Chief Plumbing Inspector for use and examination by the public.

101.0 General provisions.

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101.3 Scope. The provisions of this Code shall apply to the construction, alteration, moving, removal, repair and use of any plumbing or drainage work, and the qualification and registration of certain persons performing such work on any premises within the unincorporated territory of the County of Los Angeles, and to such work or use by the County of Los Angeles in any incorporated city not exercising jurisdiction over such work or use.

Where the requirements of this Code conflict with the requirements of Title 29 - Mechanical Code of the Los Angeles County Code, this Code shall prevail.

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101.5 Use of Terms.

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1. For purposes of administering the requirements of Title 28, Appendix KH relating to the plan approval of private sewage disposal systems or plan approval of any construction activity impacting a private sewage disposal system, the Authority Having Jurisdiction shall be the Health Officer;

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103.2 Time Limit. Every permit issued by the Building Official under the provisions of this Code shall expire by limitation and become null and void if the work authorized by such permit is not commenced within 180 days from the date of such permit, or if the work authorized by such permit is suspended or abandoned for a period of 180 days, or the permittee fails to obtain inspection as required by the provisions of Section 104 of this Code ~~at any time after the work is commenced for a period of 180 days. Before such work can be recommenced, a new permit shall be first obtained, and the fee therefor shall be one-half the amount required for a new permit for such work, provided no changes have been made or will be made in the original plans and specifications for such work; and provided further, that the new permit is obtained no later than one year from date of the initial permit or that the period of the suspension or abandonment has not exceeded one year.~~

EXCEPTION: Permits issued to abate violation(s) in conjunction with a code enforcement action shall expire and become null and void at a date determined by the Building Official.

~~Any permittee holding an unexpired permit may apply for an extension of time within which work may commence under that permit. The Building Official may extend~~

the time for action by the permittee for a period not exceeding 180 days from the date of expiration upon written request by the permittee showing that circumstances beyond the control of the permittee have prevented action from being taken and payment of a fee in an amount determined by the Building Official, not to exceed equal to 25 percent of the original permit fee. No permit shall be extended more than twice. ~~In order to renew action on a permit after expiration, except as provided for above, the permittee shall pay a new full permit fee.~~ Once a permit, including any extension(s) thereof, has expired, the permittee shall file a new application as specified in Section 103.9.

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103.9 Application for Permit.

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~~An application for a permit shall expire if no permit is issued within one year following the date of application. Plans and specifications previously submitted may thereafter be returned to the applicant or destroyed by the Chief Plumbing Inspector. The Chief Plumbing Inspector may grant up to two extensions of up to 180 days per extension, beyond the initial one year period upon written request by the applicant showing that circumstances beyond the control of the applicant have prevented the applicant from taking the actions requested by the Chief Plumbing Inspector and upon the payment of an extension fee as determined by the Chief Plumbing Inspector, not to exceed 25 percent of the plan check fee.~~

When no permit is issued within one year following the date of the application therefor, the application shall automatically expire. Plans and specifications previously

submitted may thereafter be returned to the applicant or destroyed by the Chief Plumbing Inspector. The Chief Plumbing Inspector may, before or after expiration of the application, grant up to two extensions, not exceeding 180 days per extension, beyond the initial one-year limit upon written request by the applicant showing that circumstances beyond the control of the applicant have prevented action from being taken and upon the payment of an extension fee as determined by the Chief Plumbing Inspector, not to exceed 25 percent of the plan check fee.

Once an application ~~and~~, including any extension(s) thereof ~~have~~has expired, the applicant shall file a new application, resubmit plans and specifications and pay a new plan checking or review fee.

SECTION 3. Section 301.1.2 is hereby amended to read as follows:

301.1.2 Standards. Standards listed or referred to in this eChapter or other eChapters cover materials that will conform to the requirements of this eCode, where used in accordance with the limitations imposed in this or other chapters thereof and their listing. Where a standard covers materials of various grades, weights, quality, or configurations, the portion of the listed standard that is applicable shall be used. Design and materials for special conditions or materials not provided for herein shall be permitted to be used only by special permission of the Authority Having Jurisdiction after the Authority Having Jurisdiction has been satisfied as to their adequacy. A list of accepted plumbing material standards is referenced in Table 1401.1. Solar energy systems and material standards are referenced in Table S-17 of Appendix S. IAPMO Installation Standards are referenced in Appendix I for the convenience of the users of

this eCode. They are not considered as a part of this eCode unless formally adopted as such by the Authority Having Jurisdiction.

SECTION 4. Section 301.2 is hereby amended to read as follows:

301.2 Alternate Materials and Methods of Construction

Equivalency and Modifications.

301.2.1 Alternate Materials and Methods of Construction.

Nothing in this eCode is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this eCode. Technical documentation shall be submitted to the Authority Having Jurisdiction to demonstrate equivalency. The Authority Having Jurisdiction shall have the authority to approve or disapprove the system, method, or device for the intended purpose. [HCD 1] (See Section 1.8.7).

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301.2.1.1 Testing.

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301.2.1.1.1 Tests.

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301.2.1.2.1.2 Request by Authority Having Jurisdiction.

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301.2.2 Modifications. Whenever there are practical difficulties involved in carrying out the provisions of this Code, the Authority Having Jurisdiction may grant minor modifications on a case by case basis, provided the Authority Having

Jurisdiction shall first find that a special individual reason makes the strict letter of this Code impractical and that the modification is in reasonable conformity with the spirit and purpose of this Code and that such modification does not lessen any health, fire-protection, or other life-safety related requirements. The details of any action granting modifications shall be recorded and entered in the files of the Authority Having Jurisdiction.

SECTION 5. Table 604.1 is hereby amended to read as follows:

TABLE 604.1

MATERIALS FOR BUILDING SUPPLY AND WATER DISTRIBUTION PIPING AND FITTINGS

MATERIAL	BUILDING SUPPLY PIPE AND FITTINGS	WATER DISTRIBUTION OR SOLAR THERMAL PIPE AND FITTINGS [§]	REFERENCED STANDARD(S) PIPE	REFERENCED STANDARD(S) FITTINGS
Asbestos-Cement	X ¹	—	ASTM C 296	—
Brass	X	X	ASTM B 43, ASTM B 135	—
Copper	X	X [§]	ASTM B 42, ASTM B 75, ASTM B 88, ASTM B 251, ASTM B 302, ASTM B 447	ASME B16.15, ASME B16.18, ASME B16.22, ASME B16.26
CPVC	X	X	ASTM D 2846, ASTM F 441, ASTM F 442	ASTM D 2846, ASTM F 437, ASTM F 438, ASTM F 439, ASTM F 1970
Ductile-Iron	X	X [§]	AWWA C151	ASME B16.4, AWWA C110, AWWA C153
Galvanized Steel	X	X [§]	ASTM A 53	—
Malleable Iron	X	X ²	—	ASME B16.3
PE	X ¹	—	ASTM D 2239, ASTM D 2737, ASTM D 3035, AWWA C901, CSA B137.1	ASTM D 2609, ASTM D 2683, ASTM D 3261, ASTM F 1055, CSA B137.1

PE-AL-PE	X	X	ASTM F 1282, CSA B137.9	ASTM F 1282, ASTM F 1974, CSA B137.9
PE-RT	X	X	ASTM F 2769	ASTM F 1807, ASTM F 2098, ASTM F 2159; ASTM F 2735, ASTM F 2769
PEX ^{2, 3}	X	X	ASTM F 876, ASTM F 877 CSA B137.5, AWWA C904 ¹	ASSE 1061, ASTM F 877, ASTM F 1807, ASTM F 1960, ASTM F 1961, ASTM F 2080, ASTM F 2159, ASTM F 2735, CSA B137.5
PEX-AL-PEX ⁴	X	X	ASTM F 1281, CSA B137.10, ASTM F 2262	ASTM F 1281, ASTM F 1974, ASTM F 2434, CSA B137.10
PP	X	X	ASTM F 2389, CSA B137.11	ASTM F 2389, CSA B137.11
PVC	X ¹	—	ASTM D 1785, ASTM D 2241, AWWA C900	ASTM D 2464, ASTM D 2466, ASTM D 2467, ASTM F 1970
Stainless Steel	X	X	ASTM A 269, ASTM A	—

¹ For Building Supply or cold-water applications.

² When PEX tubing is placed in soil and is used in potable water systems intended to supply drinking water to fixtures or appliances, the tubing or piping shall be sleeved with a material approved for potable water use in soil or other material that is impermeable to solvents or petroleum products.

³ PEX tubing shall meet or exceed the requirements of ASTM F876-08 or an equivalent or more stringent standard when used in continuously recirculating hot water systems and the PEX tubing is exposed to the hot water 100% of the time.

⁴ [For BSC, DSA-SS, DSA-SS/CC & HCD] The use of PEX-AL-PEX in potable water supply systems is not adopted.

⁵ Copper tube for solar thermal piping shall have a weight of not less than Type L. Type M copper tubing shall be permitted to be used for solar thermal piping where piping is aboveground in, or on, a building or underground outside of structures.

⁶ Cast iron fittings not more than 2 inches (50 mm) in size, where used in connection with potable water piping, shall be galvanized.

⁷ Malleable iron water fittings shall be galvanized.

⁸ Galvanized steel shall not be used in solar thermal systems where in contact with glycol heat transfer fluid.

SECTION 6. Section 609.7 is hereby amended to read as follows:

609.7 Abutting Lot. Nothing contained in this eCode shall be

construed to prohibit the use of all or part of an abutting or adjacent lot or lots to:

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SECTION 7. Section 713.1 is hereby amended to read as follows:

713.1 Where Required. A building in which plumbing fixtures are installed and premises having drainage piping thereon shall have a connection to a public or private sewer, except as provided in Sections ~~404.8~~101.3.3, 713.2, and 713.4.

SECTION 8. Section 721.3 is hereby added to read as follows:

721.3 Public Sewer. If the public sewer does not extend to a point from which each building on a lot or parcel of land large enough to permit future subdivision can be independently served, the property owner shall construct a public sewer as required by Title 20 – Utilities of the Los Angeles County Code, Division 2 – Sanitary Sewer and Industrial Waste Ordinance, to provide adequate sewerage for each such possible parcel.

EXCEPTION: When the Authority Having Jurisdiction finds that the character of a lot is such that no further subdivision can be reasonably anticipated, or the use is such as to preclude subdivision, or where the owner has executed a covenant stating that the lot or parcel of land together with all improvements thereon will be maintained as a unit and that before any subdivision is made or any portion of said lot is transferred to another owner, separate sewerage facilities as hereinbefore required in this Section will be installed, the drainage system of all buildings may be connected to a common building sewer or private sewage disposal system. The covenant shall be recorded, by the owner, in the office of the Department of Registrar-Recorder as part of the conditions of ownership of said property. Such agreement shall be binding on all heirs, successors, and assigns to said property.

This exception shall apply only while the whole of such lot remains in one undivided ownership. Upon the transfer of any portion of such lot other than the whole thereof, to another owner, whether such transfer is made before or after the operative date of the ordinance adding this provision, the exception shall cease and a person shall not use or maintain any building or structure except in compliance with the provisions of this Code. As used in this Section, a sale, foreclosure, or contract to sell by the terms of which the purchaser is given the right of possession shall be deemed a transfer.

SECTION 9. Section 728.0 is hereby added to read as follows:

728.0 Building Sewer Connection Requirements.

728.1 Size. That portion of the building sewer extending from the public sewer to the property line shall be not less than four (4) inches (100 mm) in internal diameter.

728.2 Depth. When laid within the limits of any public thoroughfare when the public sewer is sufficiently deep, no building sewer shall be less than six (6) feet (1.8 m) below grade. Whenever practicable, the alignment and grade of each building sewer shall be straight from the public sewer to the property line.

728.3 Taps and Saddles. Whenever it becomes necessary to connect a building sewer to a public sewer at a point where no branch fitting has been installed in the public sewer, such connection shall be made as required by Title 20 – Utilities of the Los Angeles County Code, Division 2 – Sanitary Sewer and Industrial Waste Ordinance.

728.4 **Connection to Trunks.** Whenever required, an approved-type unvented running trap shall be installed in each building sewer which is connected directly to a trunk sewer by any means whatsoever. Each such running trap shall be installed in the building sewer between the house drain or drains and the connection to the trunk sewer. A T-type cleanout shall be installed in the building sewer immediately below the running trap. This cleanout need not be extended to grade. Every running trap and cleanout shall be located on the lot served by the building sewer.

728.5 **Street Widening.** Where a future street or road-widening area has been established by the master plan of highways or in any other manner, all work installed in such area shall conform to the requirements established in this or other related ordinances for work on public property.

728.6 **Main Line Required.** Building sewer construction shall conform to the requirements of main line sewers as set forth in Title 20 – Utilities of the Los Angeles County Code, Division 2 – Sanitary Sewer and Industrial Waste Ordinance, when either of the following conditions exist:

1. Where the Authority Having Jurisdiction requires such construction because of the character or quantity of the sewage or industrial waste to be discharged.
2. Where the sewer is designed to be, or proposed to be, dedicated to the County of Los Angeles at the present or any future time.

SECTION 10. Table H 1.7 of Appendix H is hereby amended to read as

follows:

TABLE H 1.7
LOCATION OF SEWAGE DISPOSAL SYSTEM

MINIMUM HORIZONTAL DISTANCE IN CLEAR REQUIRED FROM	BUILDING SEWER	SEPTIC TANK	DISPOSAL FIELD	SEEPAGE PIT OR CESSPOOL
Building or structures ¹	2 feet	5 feet	8 feet	8 feet
Property line adjoining private	Clear ²	5 feet	5 feet	8 feet
Water supply wells ³	50 feet ³	50 feet	100 feet	150 feet
Streams and other bodies of water ³	50 feet	50 feet	100 feet ⁷	150 feet ⁷
Trees		10 feet		10 feet
Seepage pits or cesspools ⁸		5 feet	5 feet	12 feet
Disposal field ⁸		5 feet	4 feet ⁴	5 feet
On-site domestic water service line	1 foot ⁵	5 feet	5 feet	5 feet
Distribution box			5 feet	5 feet
Pressure public water main	10 feet ⁶	10 feet	10 feet	10 feet

For SI units: 1 foot = 304.8 mm

Notes:

- 1 Including porches and steps, whether covered or uncovered, breezeways, roofed porte cocheres, roofed patios, carports, covered walks, covered driveways, and similar structures or appurtenances.
- 2 See Section 312.3.
- 3 Drainage piping shall clear domestic water supply wells by not less than 50 feet (15 240 mm). This distance shall be permitted to be reduced to not less than 25 feet (7620 mm) where the drainage piping is constructed of materials approved for use within a building.
- 4 Plus 2 feet (610 mm) for each additional 1 foot (305 mm) of depth in excess of 1 foot (305 mm) below the bottom of the drain line. (See Section H 6.0)
- 5 See Section 720.0.
- 6 For parallel construction For crossings, approval by the Health Department shall be required.
- 7 These minimum clear horizontal distances shall also apply between disposal fields, seepage pits, and the mean high-tide line.
- 8 Where disposal fields, seepage pits, or both are installed in sloping ground, the minimum horizontal distance between any part of the leaching system and ground surface shall be 15 feet (4572 mm).
- 9 Where special hazards are involved, the distance required shall be increased as may be directed by the Authority Having Jurisdiction.

SECTION 11. Table H 2.1 of Appendix H is hereby amended to read as

follows:

TABLE H 2.1
CAPACITY OF SEPTIC TANKS^{1, 2, 3, 4}

SINGLE-FAMILY DWELLINGS - NUMBER OF BEDROOMS ²	MULTIPLE DWELLING UNITS OR APARTMENTS - ONE BEDROOM EACH	OTHER USES: MAXIMUM FIXTURE UNITS SERVED PER TABLE 702.1	MINIMUM SEPTIC TANK CAPACITY (gallons)
1 or 2	—	15	750
3	—	20	1000
4	2 units	25	1200
5 or 6	3	33	1500
—	4	45	2000
—	5	55	2250
—	6	60	2500
—	7	70	2750
—	8	80	3000
—	9	90	3250
—	10	100	3500

For SI units: 1 gallon = 3.785 L

Notes:

- Extra bedroom, 150 gallons (568 L) each.
- Extra dwelling units over 10:250 gallons (946 L) each.
- Extra fixture units over 100, 25 gallons (94.6 L) per fixture unit.
- Septic tank sizes in this table include sludge storage capacity and the connection of domestic food waste disposal units without further volume increase.
- Applies to mobile homes not installed in a mobile home park.

SECTION 12. Table H 2.1(1) of Appendix H is hereby amended to read as follows:

TABLE H 2.1(1)
ESTIMATED WASTE SEWAGE FLOW RATES^{1, 2, 3}

TABLE H 2.1(1)
ESTIMATED WASTE SEWAGE FLOW RATES^{1, 2, 3}

TYPE OF OCCUPANCY	GALLONS PER DAY
1. Airports.....	15 per employee 5 per passenger
2. Auto washers	Check with equipment manufacturer
3. Bowling alleys (snack bar only).....	75 per lane
4. Camps:	
Campground with central comfort station	35 per person
Campground with flush toilets, no showers.....	25 per person
Day camps (no meals served)	15 per person
Summer and seasonal.....	50 per person
5. Churches (Sanctuary).....	5 per seat
with kitchen waste	7 per seat
6. Dance halls	5 per person
7. Factories	
no showers.....	25 per employee
with showers	35 per employee
Cafeteria, add	5 per employee
8. Hospitals.....	250 per bed
kitchen waste only.....	25 per bed

laundry waste only	40 per bed
9. Hotels (no kitchen waste).....	60 per bed (2 person)
10. Institutions (Resident)	75 per person
Nursing home.....	125 per person
Rest home.....	125 per person
11. Laundries, self-service	
(minimum 10 hours per day).....	50 per wash cycle 300 per machine
Commercial	Per manufacturer's specifications
12. Motel	50 per bed space
with kitchen.....	60 per bed space
13. Offices	20 per employee
14. Parks, mobile homes.....	250 per space
Picnic parks (toilets only).....	20 per parking space
Recreational vehicles	
without water hook-up.....	75 per space
with water and sewer hook-up.....	100 per space
15. Restaurants – cafeterias	20 per employee 50 per seat
toilet	7 per customer
kitchen waste.....	6 per meal
add for garbage disposal.....	1 per meal
add for cocktail lounge.....	2 per customer
kitchen waste – disposable service.....	2 per meal
16. Schools – Staff and office	20 per person
Elementary students	15 per person
Intermediate and high.....	20 per student
with gym and showers, add	5 per student
with cafeteria, add.....	3 per student
Boarding, total waste	100 per person
17. Service station, toilets	1000 for 1st bay
	500 for each additional bay
18. Stores	20 per employee
Public restrooms, add	1 per 10 square feet of floor space
19. Swimming pools, public	10 per person
20. Theaters, auditoriums.....	5 per seat
Drive-in.....	10 per space

For SI units: 1 square foot = 0.0929 m², 1 gallon per day 3.785 L/day

Notes:

¹ Sewage disposal systems sized using the estimated waste/sewage flow rates shall be calculated as follows:

- (a) Waste/sewage flow, up to 1500 gallons per day (5678 L/day)
Flow x 1.5 = septic tank size
- (b) Waste/sewage flow, over 1500 gallons per day (5678 L/day)
Flow x 0.75 + 1125 = septic tank size
- (c) Secondary system shall be sized for total flow per 24 hours.

² See Section H 2.1.

³ Because of the many variables encountered, it is not possible to set absolute values for waste/sewage flow rates for all situations. The designer should evaluate each situation and, where figures in this table need modification, they should be made with the concurrence of the Authority Having Jurisdiction.

SECTION 13. Table H 2.1(3) of Appendix H is hereby amended to read as

follows:

TABLE H 2.1(2)

DESIGN CRITERIA OF FIVESIX TYPICAL SOILS

TYPE OF SOIL	REQUIRED SQUARE FEET OF LEACHING AREA PER 100 GALLONS	MAXIMUM ABSORPTION CAPACITY IN GALLONS PER SQUARE FEET OF LEACHING AREA FOR A 24 HOUR PERIOD
Coarse sand or gravel	20	5.0
Fine sand	25	4.0
Sandy loam or sandy clay	40	2.5
<u>Sandy clay</u>	<u>60</u>	<u>1.66</u>
Clay with considerable sand or gravel	90	1.1
Clay with small amount of sand or gravel	120	0.8

For SI units: 1 square foot = 0.0929 m², 1 gallon = 3.785 L, 1 gallon per square foot = 40.7 L/m²

SECTION 14. Table H 2.1(3) of Appendix H is hereby amended to read as follows:

TABLE H 2.1(3)

LEACHING AREA SIZE BASED ON SEPTIC TANK CAPACITY

REQUIRED SQUARE FEET OF LEACHING AREA PER 100 GALLONS SEPTIC TANK CAPACITY (square feet per 100 gallons)	MAXIMUM SEPTIC TANK SIZE ALLOWABLE (gallons)
20-25	7500
40	5000
<u>60</u>	<u>3500</u>
90	3500 <u>3000</u>
120	3000 <u>2500</u>

For SI units: 1 square foot per 100 gallons = 0.000245 m²/L, 1 gallon = 3.785 L

SECTION 15. Section H 3.1 is hereby amended to read as follows:

H 3.1 General.

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(3) No excavation for a leach line or leach bed shall be located within ~~5 feet (1,524 mm)~~ 10 feet (3048 mm) of the groundwater table nor to a depth where sewage is

~~capable of may contaminating~~ the underground water stratum ~~that is useable for domestic purposes.~~

EXCEPTION: ~~In areas where the records or data indicate that the ground waters are grossly degraded, the 5 foot (1524 mm) separation requirement shall be permitted to be reduced by the Authority Having Jurisdiction.~~ When approved by the Authority Having Jurisdiction, this distance may be reduced to 5 feet (1.5 m) from ocean water. The applicant shall supply evidence of groundwater depth to the satisfaction of the Authority Having Jurisdiction.

(4) The minimum effective absorption area in any seepage pit shall be calculated as the excavated sidewall area below the inlet exclusive of any hardpan, rock, clay, or other impervious formations. The minimum required area of porous formation shall be provided in one or more seepage pits. No excavation shall extend within 10 feet (3048 mm) of ~~the groundwater table~~ nor to a depth where sewage is ~~capable of contaminating~~ may contaminate underground water stratum ~~that is useable for domestic purposes.~~

EXCEPTION: ~~In areas where the records or data indicate that the groundwaters are grossly degraded, the 10 foot (3048 mm) separation requirement shall be permitted to be reduced by the Authority Having Jurisdiction.~~ When approved by the Authority Having Jurisdiction, this distance may be reduced to 5 feet (1.5 m) from ocean water.

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SECTION 16. Section H 4.3 is hereby amended to read as follows:

H 4.3 Absorption Rates. Where a percolation test is required, the proposed system shall have the capability to absorb a quantity of clear water in a 24-hour period equal to at least five times the liquid capacity of the proposed septic tank. ~~n~~No private disposal system shall be permitted to serve a building if that test shows the absorption capacity of the soil is less than 0.83 gallons per square foot (gal/ft²) (33.8 L/m²) or more than 5.12 gal/ft² (208.6 L/m²) of leaching area per 24 hours. Where the percolation test shows an absorption rate greater than 5.12 gal/ft² (208.6 L/m²) per 24 hours, a private disposal system may be permitted where the site does not overlie groundwaters protected for drinking water supplies, a minimum thickness of 2 feet (610 mm) of the native soil below the entire proposed system is replaced by loamy sand, and the system design is based on percolation tests made in the loamy sand.

SECTION 17. Section H 6.5 is hereby amended to read as follows:

H 6.5 Distribution Boxes. Where two or more drain lines are installed, an approved distribution box of sufficient size to receive lateral lines shall be installed at the head of each disposal field. The inverts of outlets shall be level, and the invert of the inlet shall be not less than 1 inch (25.4 mm) above the outlets. Distribution boxes shall be designed to ensure equal flow and shall be installed on a level concrete slab in natural or compacted soil. Distribution boxes shall be coated on the inside with a bituminous coating or other approved method acceptable to the Authority Having Jurisdiction.

SECTION 18. Section H 6.8 is hereby amended to read as follows:

H 6.8 Dosing Tanks. ~~Where the quantity of sewage exceeds the amount that is permitted to be disposed in 500 lineal feet (152.4 m) of leach line, a dosing tank shall be used. Dosing tanks shall be equipped with an automatic siphon or pump that discharges the tank once every 3 or 4 hours. The tank shall have a capacity equal to 60 to 75 percent of the interior capacity of the pipe to be dosed at one time. Where the total length of pipe exceeds 1000 lineal feet (304.8 m), the dosing tank shall be provided with two siphons or pumps dosing alternately and each serving one half of the leach field.~~ Automatic syphon or dosing tanks shall be installed when required or as permitted by the Authority Having Jurisdiction.

SECTION 19. Section H 7.2 is hereby amended to read as follows:

H 7.2 Multiple Installations. Multiple seepage pit installations shall be served through an approved distribution box or be connected in series ~~by means of a watertight connection laid on undisturbed or compacted soil. The outlet from the pit shall have.~~ When connected in series, the effluent shall leave each pit through an approved vented leg fitting extending not less than 12 inches (305 mm) below the inlet fitting downward into such existing pit and having its outlet flow line at least 6 inches below the inlet. All pipe between pits shall be laid with approved watertight joints.

SECTION 20. Section H 10.1 is hereby amended to read as follows:

H 10.1 Inspection. Inspection requirements shall comply with the following:

(1) Applicable provisions of Section ~~403.5~~104.0 of this eCode and this appendix shall be required. Plans shall be required in accordance with Section ~~404.5~~102.1 of this eCode.

...

(5) Disposal fields and seepage pits shall not be installed in uncompacted fill.

SECTION 21. Section H 11.6 is hereby added to read as follows:

H 11.6 Excavation. No excavation for an abandoned sewer or sewage facility shall be left unattended at any time unless the permittee shall have first provided a suitable and adequate barricade to assure public safety.

SECTION 22. Appendix S is hereby added to read as follows:

APPENDIX S

SOLAR ENERGY SYSTEMS

S-1 General.

In addition to the requirements of this Appendix, the provisions of this Code shall apply to the erection, installation, alteration, relocation, replacement, addition to, use, maintenance, and repair of solar energy systems, including but not limited to equipment and appliances intended to utilize solar energy for water heating and swimming pool heating.

S-2 Definitions.

For the purpose of this Appendix, certain terms, words, phrases, and their derivatives shall be construed as set forth in this Section. Whenever terms are not defined, their ordinary dictionary meaning shall apply.

Absorber. That part of the solar collector that receives the incident radiation energy.

Ambient Temperature. Surrounding temperature.

Area, Absorber. The total projected heat transfer area from which the absorbed solar irradiation heats the transfer media.

Closed Loop System. A system where the fluid is enclosed in a piping system that is not vented to the atmosphere.

Collector. See Solar Collector.

Collector System. That section of the solar system that includes the collector and piping or ducts from the collector to the storage system.

Cover (Glazing). The material covering the aperture to provide thermal and environmental protection.

Design Pressure. The maximum allowable pressure for which a specific part of a system is designed.

Design Temperature. The maximum allowable continuous or intermittent temperature for which a specific part of a solar energy system is designed to operate safely and reliably.

Distribution System. That section of the solar system from the storage system to the point of use.

Flash Point. The minimum temperature corrected to a pressure of 14.7 psi (101 kPa) at which a test flame causes the vapors of a portion of the sample to ignite under

the conditions specified by the test procedures and apparatus. The flash point of a liquid shall be determined in accordance with ASTM D 56, ASTM D 93, or ASTM D 3278.

Heat Exchanger. A device that transfers heat from one medium to another.

Heat Transfer Medium. The medium used to transfer energy from the solar collectors to the thermal storage or load.

Langelier Saturation Index. A formula used to measure water balance or mineral saturation control of pool, spa, or hot tub water. Total alkalinity, calcium hardness, pH, water temperature, and total dissolved solids are measured, given a factor, and calculated to determine whether water has a tendency to be corrosive or scale forming.

Open Loop System. A solar thermal system where the fluid is enclosed in a piping system that is vented to the atmosphere.

Out-Gassing. As applied to thermal energy, the thermal process by which materials expel gas.

Passive Solar Systems. As used in these requirements, are solar thermal systems that utilize elements of a building, without augmentation by mechanical components such as blowers or pumps, to provide for the collections, storage, or distribution of solar energy for heating, cooling, or both.

Solar Collector. A device used to absorb energy from the sun.

Solar Energy System. A configuration of equipment and components to collect, convey, store, and convert the sun's energy for a purpose.

Solar Energy System Components. Any appliance, assembly, device, equipment, or piping used in the conversion of solar energy into thermal energy for service water heating, pool water heating, space heating and cooling, and electrical service.

Solar Thermal System. A type of solar energy system that utilizes a complete assembly of subsystems which convert solar energy into thermal energy and utilize this energy for service water heating, pool water heating, space heating and cooling purposes.

Thermosiphon. The natural circulation of fluids due to temperature differential.

Total Alkalinity. The sum of all alkaline minerals in the water that is primarily in bicarbonate form, but also as sodium, calcium, magnesium, potassium carbonates, and hydroxides. It is a measure of the water's ability to resist changes in pH.

S-3 Permits Required.

It shall be unlawful for a person, firm, or corporation to construct, install, alter, repair, replace, or remodel a solar energy system regulated by this Code or cause the same to be done without first obtaining a separate permit for each separate system or interconnected set of systems as specified in Section 103.0 of this Code.

S-4 Plans and Specifications.

Plans, engineering calculations, diagrams, and other data shall be submitted in one or more sets with each application for a permit. Where required by the Authority Having Jurisdiction, the plans, computations, diagrams, specifications and other data

shall be prepared by, and the solar energy system designed by, an engineer, an architect, or both who shall be licensed by the state to practice as such.

EXCEPTION: The submission of plans, calculations or other data may be waived where the Authority Having Jurisdiction determines that the nature of the work applied for is such that reviewing of plans is not necessary to obtain compliance within the Code.

S-5 **Inspection and Testing.**

S-5.1 **General.** Solar energy systems for which a permit is required by this Code shall be inspected by the Authority Having Jurisdiction. No solar energy system or portion thereof shall be covered, concealed, or put into use until it first has been tested, inspected, and approved as prescribed in this Code. Neither the Authority Having Jurisdiction nor the jurisdiction shall be liable for any expense entailed in the removal or replacement of material required to permit inspection. Solar energy systems regulated by this Code shall not be connected to the water, the energy fuel supply, or the sewer system until authorized by the Authority Having Jurisdiction. Installation of a solar energy system shall comply with other parts of this Code including section 104.0.

S-5.2 **Required Inspection.** New solar energy system work and such portions of existing systems as affected by new work, or changes, shall be inspected by the Authority Having Jurisdiction to ensure compliance with the requirements of this Code and to ensure that the installation and construction of the solar energy system is in accordance with approved plans. The Authority Having

Jurisdiction shall make the following inspections and other such inspections as necessary. The permittee or the permittee's authorized agent shall be responsible for the scheduling of such inspections as follows:

- (1) Underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before backfill is put in place.
- (2) Rough-in inspection shall be made prior to the installation of wall or ceiling membranes.
- (3) Final inspection shall be made upon completion of the installation.

S-5.3 **Testing.** Solar energy systems shall be tested and approved as required by this Code or the Authority Having Jurisdiction.

S-5.3.1 **Piping.** The piping of the solar thermal system shall be tested with water, air, heat transfer liquid, or as recommended by the manufacturer's instructions, except that plastic pipe shall not be tested with air. The Authority Having Jurisdiction shall be permitted to require the removal of plugs, etc., to ascertain where the pressure has reached all parts of the system. In cases where it would be impractical to provide the required water or air tests, or for minor installations and repairs, the Authority Having Jurisdiction shall be permitted to make such inspection as deemed advisable in order to be assured that the work has been performed in accordance with the intent of this Code. Joints and connections in the solar energy system shall be gastight and watertight for the pressures required by the test.

S-5.3.2 **System Requirements.** Upon completion, the solar thermal system, including piping, collectors, heat exchangers, and other related equipment, shall be tested and proved airtight.

S-5.3.2.1 **Open Loop Systems.** Open loop systems directly connected to the potable water system shall be tested under a water pressure not less than the maximum working pressure under which it is to be used. The water used for tests shall be obtained from a potable source of supply. A 50 pound-force per square inch (psi) (345 kPa) air pressure test shall be permitted to be substituted for the water test.

S-5.3.2.2 **Other Open Loop Systems.** Systems operating at atmospheric pressure shall be tested under actual operating conditions.

S-5.3.2.3 **Closed Loop Systems.** Closed loop or other type pressure systems shall be tested at one-and-one-half times maximum designed operating pressure. Systems shall withstand the test without leaking for a period of not less than 15 minutes.

S-5.3.3 **Storage Tanks.** Storage tanks conforming to the requirements of Section S-8 shall be tested in accordance with Sections S-5.3.3.1 and S-5.3.3.2.

S-5.3.3.1 **Pressure Type.** The test pressure for storage tanks that are subject to water pressure from utility mains (with or without a pressure reducing valve) shall be two times the working pressure but not less than 300 psi (2068 kPa).

S-5.3.3.2 **Non-Pressure Type.** A storage tank shall be tested by filling it with water for a period of 24 hours prior to inspection and shall withstand the test without leaking. No tank or portion thereof shall be covered or concealed prior to approval.

S-5.3.4 **Connection to Service Utilities.** No person shall make connections from a source of energy or fuel to a solar energy system or equipment regulated by this Code and for which a permit is required until approved by the Authority Having Jurisdiction. No person shall make connection from a water-supply line nor shall any person connect to a sewer system regulated by this Code and for which a permit is required until approved by the Authority Having Jurisdiction. The Authority Having Jurisdiction shall be permitted to authorize temporary connection of the solar energy system equipment to the source of energy or fuel for the purpose of testing the equipment.

S-6 **Location.**

S-6.1 **System.** Except as otherwise provided in this Code, no solar energy system, or parts thereof shall be located in a lot other than the lot that is the site of the building, structure, or premises served by such facilities.

S-6.2 **Ownership.** No subdivision, sale, or transfer of ownership of existing property shall be made in such manner that the area, clearance, and access requirements of this Code are decreased.

S-7 **Abandonment.**

S-7.1 **General.** An abandoned solar thermal system or part thereof shall be disconnected from remaining systems, drained, plugged, and capped in a manner satisfactory to the Authority Having Jurisdiction.

S-7.2 **Storage Tank.** An underground water storage tank that has been abandoned or discontinued otherwise from use in a solar thermal system shall be completely drained and filled with earth, sand, gravel, concrete, or other approved material or removed in a manner satisfactory to the Authority Having Jurisdiction.

S-8 **Tanks.**

S-8.1 **Storage Tanks.**

S-8.1.1 **Plans.** Plans for storage tanks shall be submitted to the Authority Having Jurisdiction for approval, unless listed by an approved listing agency. Such plans shall show dimensions, reinforcing, structural calculations, and such other pertinent data as required by the Authority Having Jurisdiction.

S-8.1.2 **Gravity Storage Tanks.** Gravity storage tanks shall be installed with an overflow opening of not less than 2 inches (50 mm) Internal Pipe Size (IPS). The openings shall be aboveground and installed with a screened return bend.

S-8.1.3 **Prefabricated Storage Tanks.** Prefabricated storage tanks shall be listed by an approved agency and labeled.

S-8.1.4 **Pressure-Type Storage Tanks.** Pressure-type water storage tanks shall be installed with a listed combination temperature and pressure relief valve. The temperature setting shall not exceed 210°F (99°C). The pressure setting shall not exceed 150 percent of the maximum designed operating pressure of

the solar thermal system, or 150 percent of the established normal operating pressure of the piping materials, or the labeled maximum operating pressure of a pressure-type storage tank, whichever is less. The relief valve setting shall not exceed the recommendations of the equipment manufacturer.

All storage tanks, including bottom-fed storage tanks, connected to a water heater shall be provided with a vacuum relief valve at the top of the tank that will operate up to a water pressure not exceeding 200 psi (1379 kPa) and up to a temperature not exceeding 250°F (121°C) to prevent siphoning of any water heater or storage tank. The size of such vacuum relief valves shall have a minimum rated capacity for the equipment served. This Section shall not apply to pressurized captive air diaphragm/bladder storage tanks.

Valves shall not be located on either side of a relief valve connection. The relief valve discharge pipe shall be of approved material that is rated for the temperature of the solar thermal system. The discharge pipe shall be the same diameter as the relief valve outlet, and shall discharge by gravity through an air gap into the drainage system or outside of the building with the end of the pipe not exceeding 2 feet (610 mm) nor less than 6 inches (152 mm) above the ground and pointing downward.

S-8.1.5 **Separate Storage Tanks.** For installations with separate storage tanks, a pressure relief valve and temperature relief valve or combination thereof shall be installed on both the water heater and storage tank. There shall not be a check valve or shutoff valve between a relief valve and the heater or tank served.

The relief valve discharge pipe shall be of approved material that is rated for the temperature of the solar thermal system. The discharge pipe shall be the same diameter as the relief valve outlet, discharge by gravity through an air gap into the drainage system or outside of the building with the end of the pipe not exceeding 2 feet (610 mm) nor less than 6 inches (152 mm) above the ground and pointing downward. Discharges from such valves on solar thermal systems utilizing other than potable water heat transfer mediums shall be approved by the Authority Having Jurisdiction.

S-8.1.6 **Underground Storage Tanks.** Storage tanks shall be permitted to be buried underground where designed and constructed for such installation.

S-8.1.7 **Pressure Vessels.** Pressure vessels, and the installation thereof, shall comply with minimum requirements for safety from structural failure, mechanical failure, and excessive pressures in accordance with the requirements of the Authority Having Jurisdiction and nationally recognized standards.

S-8.1.8 **Devices.** Devices attached to or within a storage tank shall be accessible for repair and replacement.

S-8.1.9 **Storage Tank Covers.** Storage tank covers shall be structurally designed to withstand anticipated loads and pressures in accordance with the manufacturer's instructions.

S-8.1.10 **Watertight Pan.** Where a storage tank is installed in an attic, attic-ceiling assembly, floor-ceiling assembly, or floor subfloor assembly where damage could result from a leaking storage tank, a watertight pan of corrosion-resistant

materials shall be installed beneath the storage tank with not less than 3/4 of an inch (20 mm) diameter drain to a location satisfactory to the Authority Having Jurisdiction.

S-8.1.11 **Storage Tank Materials.**

S-8.1.11.1 **Construction.** Storage tanks shall be constructed of durable materials not subject to excessive corrosion or decay and shall be watertight. Each such tank shall be structurally designed to withstand anticipated loads and pressures and shall be installed level and on a solid bed.

S-8.1.11.2 **Standards.** Storage tanks shall be constructed in accordance with recognized standards referenced in this Code and approved by the Authority Having Jurisdiction.

S-8.1.11.3 **Concrete.** The walls and floor of each poured-in-place, concrete storage tank shall be monolithic. The exterior walls shall be double-formed so as to provide exposure of the exterior walls during the required water test. The compressive strength of a concrete tank wall, top and covers, or floor shall be not less than 2500 pounds per square inch (lb/in²) (1.7577 E+06 kg/m²). Where required by the Authority Having Jurisdiction, the concrete shall be sulfate resistant (Type V Portland Cement).

S-8.1.11.4 **Metal Storage Tanks.** Metal storage tanks shall be welded, riveted and caulked, brazed, bolted, or constructed using a combination of these methods. Filler metal used in brazing for a metal storage tank shall be non-ferrous metal or an alloy having a melting point above 1000°F (538°C) and below that of the metal joined.

S-8.1.11.5 Non-Fiberglass Storage Tanks. Non-fiberglass storage tanks shall be constructed in accordance with ASME Boiler and Pressure Vessel Code, Section VIII or other approved standards.

S-8.1.11.6 Fiber-Reinforced Storage Tanks. Fiber-reinforced storage tanks shall be constructed in accordance with ASME Boiler and Pressure Vessel Code, Section X or other approved standards.

S-8.2 Expansion Tanks.

S-8.2.1 Where Required. An expansion tank shall be installed in a solar thermal system where a pressure reducing valve, backflow prevention device, check valve or other device is installed on a water supply system utilizing storage or tankless water heating equipment as a means for controlling increased pressure caused by thermal expansion. Expansion tanks shall be of the closed or open type and securely fastened to the structure. Expansion tanks shall be rated for the pressure of the system. Supports shall be capable of carrying twice the weight of the expansion tank filled with water without placing strain on the connecting piping.

Solar thermal systems incorporating hot water tanks or fluid relief columns shall be installed to prevent freezing under normal operating conditions.

S-8.2.2 Solar Thermal Systems with Open-Type Expansion Tanks. Open-type expansion tanks shall be located not less than 3 feet (914 mm) above the highest point of the system. Such tanks shall be sized based on the capacity of the system. An overflow with a diameter of not less than one-half the size of the

water supply or not less than 1 inch (25 mm) in diameter shall be installed at the top of the expansion tank. The overflow shall discharge through an air gap into the drainage system.

S-8.2.3 Closed-Type Solar Thermal Systems. Closed-type solar thermal systems shall have an airtight tank or other approved air cushion that will be consistent with the volume and capacity of the system, and shall be designed for a hydrostatic test pressure of two and one-half times the allowable working pressure of the system. Expansion tanks for systems designed to operate at or above 30 pounds-force per square inch (psi) (207 kPa) shall be constructed in accordance with nationally recognized standards and the Authority Having Jurisdiction. Provisions shall be made for draining the tank without emptying the system, except for pressurized tanks.

S-8.2.4 Minimum Capacity of Closed-Type Expansion Tank. The minimum capacity of a closed-type expansion tank shall be in accordance with Table S-8.2.4(1) and Table S-8.2.4(2) or from the following formula:

$$V_t = \frac{(0.00041t - 0.0466) V_s}{\left(\frac{P_a}{P_f} - \frac{P_a}{P_o}\right)} \quad \text{(Equation S-8.2.4)}$$

Where:

- V_t = Minimum volume of expansion tank, gallons.
- V_s = Volume of system, not including expansion tank, gallons.
- t = Average operating temperature, °F.
- P_a = Atmospheric pressure, feet H₂O absolute.
- P_f = Fill pressure, feet H₂O absolute.
- P_o = Maximum operating pressure, feet H₂O absolute.

For SI units: 1 gallon = 3.785 L, °C = (°F-32)/1.8, 1 foot of water = 2.989 kPa

TABLE S-8.2.4(1)**EXPANSION TANK CAPACITIES FOR GRAVITY HOT WATER SYSTEMS**

INSTALLED EXPANSION DIRECT RADIATION* (square feet)	TANK CAPACITY (gallons)
Up to 350	18
Up to 450	21
Up to 650	24
Up to 900	30
Up to 1100	35
Up to 1400	40
Up to 1600	2 to 30
Up to 1800	2 to 30
Up to 2000	2 to 35
Up to 2400	2 to 40

For SI units: 1 gallon = 3.785 L, 1 square foot = 0.0929 m²

*For systems exceeding 2400 square feet (222.9 m²) of installed equivalent direct water radiation, the required capacity of the cushion tank shall be increased on the basis of 1 gallon (3.785 L) tank capacity per 33 square feet (3.1 m²) of additional equivalent direct radiation.

TABLE S-8.2.4(2)**EXPANSION TANK CAPACITIES FOR FORCED HOT WATER SYSTEMS**

SYSTEM VOLUME*	TANK CAPACITY (gallons)
100	15
200	30
300	45
400	60
500	75
1000	150
2000	300

For SI units: 1 gallon = 3.785 L

*Includes volume of water in boiler, radiation, and piping, not including expansion tank.

S-9 Solar Collectors.**S-9.1 Construction.**

S-9.1.1 General. Frames and braces exposed to the weather shall be constructed of materials for exterior locations, and protected from corrosion or deterioration, in accordance with the requirements of the Authority Having Jurisdiction.

S-9.1.2 Construction. Collectors shall be designed and constructed to prevent interior condensation, out-gassing, or other processes that will reduce the transmission properties of the glazing, reduce the efficiency of the insulation, or otherwise adversely affect the performance of the collector.

S-9.1.3 Glass. Glass used in collector construction shall be tempered.

S-9.1.4 Plastic. Plastic used in collector construction shall be installed in accordance with the manufacturer's installation instructions.

S-9.1.5 Listing. Collectors that are manufactured as a complete component shall be listed or labeled by an approved listing agency in accordance with SRCC 100, UL 1279, or equivalent standard.

S-9.1.6 Air Collectors. Materials exposed within air collectors shall be noncombustible or shall have a flame spread index not to exceed 25 and a smoke developed index not to exceed 50 where tested as a composite product in accordance with ASTM E 84 or UL 723.

S-9.1.6.1 Testing. Materials used within an air collector shall not smoke, smolder, glow, or flame where tested in accordance with ASTM C 411 at temperatures exposed to in service. In no case shall the test temperature be less than 250°F (121°C).

S-9.2 **Solar Collector Installation.**

S-9.2.1 **General.** Solar collectors shall be anchored to roof structures or other surfaces in accordance with the manufacturer's installation instructions and the Title 26 – Building Code of the Los Angeles County Code. Collectors shall be mounted to minimize the accumulation of debris. Connecting pipes shall not be used to provide support for a solar collector.

S-9.2.2 **Roof Installations.** Anchors secured to and through a roofing material shall be made to maintain the water integrity of the roof covering. Roof drainage shall not be impaired by the installation of collectors. Solar collectors that are not an integral part of the roofing system shall be installed to preserve the integrity of the roof surface.

S-9.2.3 **Ground Installations.** Solar collectors installed at ground level shall be not less than 6 inches (152 mm) above the ground level.

S-9.2.4 **Access.** Access shall be provided to collectors and components in an approved manner. A work space adjacent to collectors for maintenance and repair shall be provided in accordance with requirements of the Authority Having Jurisdiction.

S-9.2.5 **Stagnation Condition.** The collector assembly shall be capable of withstanding stagnant conditions in accordance with the manufacturer's instructions where high solar flux and no flow occurs.

S-9.2.6 **Waterproofing.** Joints between structural supports and buildings or dwellings, including penetrations made by bolts or other means of fastening, shall be made watertight with approved material.

S-9.2.7 **Fasteners.** Mountings and fasteners shall be made of corrosion-resistant materials. Carbon steel mountings and fasteners shall be classified as noncorrosive in accordance with ASME SA194.

S-9.2.8 **Combustible Materials.** Collectors constructed of combustible materials shall not be located on or adjacent to construction required to be of noncombustible materials or in Very High Fire Hazard Severity Zone (VHFHSZ) as defined in Title 32 – Fire Code of the Los Angeles County Code, unless approved by the Authority Having Jurisdiction.

S-9.2.9 **Orientation.** Collectors shall be located and oriented in accordance with the manufacturer's installation instructions.

S-9.2.10 **Wall Mounted.** Solar collectors that are mounted on a wall shall be secured and fastened in an approved manner in accordance with Section 313.0 of this Code.

S-9.3 **Fire Safety Requirements.**

S-9.3.1 **Building Components.** Collectors that function as building components shall be in compliance with Title 26 – Building Code of the Los Angeles County Code.

S-9.3.2 **Above or On the Roof.** Collectors located above or on roofs, and functioning as building components, shall not reduce the required fire-resistance and fire-retardance classification of the roof covering materials.

EXCEPTIONS:

(1) Collectors located on buildings not exceeding three stories in height, a 9000 square feet (836.13 m²) total floor area; or both providing:

(a) The collectors are noncombustible.

(b) Collectors with plastic covers have noncombustible sides and bottoms, and the total area covered and the collector shall not exceed the following:

(i) Plastic CC1 – 33¹/₃ percent of the roof area.

(ii) Plastic CC2 – 25 percent of the roof area.

(c) Collectors with plastic film covers having a thickness of not more than 0.010 of an inch (0.254 mm) shall have noncombustible sides and bottoms, and the total area covered by the collector shall not exceed 33¹/₃ percent of the roof area.

S-10 **Hazardous Heat Transfer Medium for Solar Thermal Systems.**

S-10.1 **Approval.** Heat-transfer mediums that are hazardous shall not be used in solar thermal systems, except with prior approval of the Authority Having Jurisdiction.

S-10.2 **Flash Points.** The flash point of a heat-transfer medium shall be:

(1) Not less than 50°F (10°C) above the design maximum nonoperating temperature and as high as the maximum stagnation temperature of the medium in the solar thermal system.

(2) Not less than 50°F (10°C) above the design maximum operating temperature and exceeding the maximum stagnation temperature minus 200°F (93°C) of the medium in the solar thermal system.

S-10.3 Discharge. The collector, collector manifold, and manifold relief valve shall not discharge directly or indirectly into the building or toward an open flame or other source of ignition.

S-11 Heat Exchangers.

S-11.1 General. Heat exchangers used for heat transfer, heat recovery, or solar thermal systems shall protect the potable water system from being contaminated by the heat transfer medium. Single-wall heat exchangers shall meet the requirements of Section S-11.2. Double-wall heat exchangers shall separate the potable water from the heat transfer medium by providing a space between the two walls that is vented to the atmosphere.

S-11.2 Single-Wall Heat Exchangers. Solar thermal systems that incorporate a single-wall heat exchanger shall meet the following requirements:

(1) The heat transfer medium is either potable water or contains fluids recognized as safe by the Food and Drug Administration (FDA) as food grade.

(2) Bears a label with the word "Caution," followed by the following statements:

(a) The heat transfer medium must be water or other nontoxic fluid recognized as safe by the FDA.

(b) The maximum operating pressure of the heat exchanger is not permitted to exceed the maximum operating pressure of the potable water supply.

(3) The word "Caution" and the statements in letters shall have an uppercase height of not less than 0.120 of an inch (3.048 mm). The vertical spacing between lines of type shall be not less than 0.046 of an inch (1.168 mm). Lowercase letters shall be not less than compatible with the uppercase letter size specification.

S-12 Valves.

S-12.1 General. Valves shall be rated for the operating temperature and pressures of the solar thermal system and shall be compatible with the type of heat transfer medium. Valves shall be approved for the installation with the piping materials to be installed.

S-12.2 Fullway Valves. A fullway valve shall be installed on the water supply to solar thermal systems and on the water supply pipe to a gravity or pressurized water tank or to a water heater.

S-12.3 Shutoff Valves. A shutoff valve shall be installed on the supply line to each appliance, equipment, or pressure vessel and on a nondiaphragm-type expansion tank.

S-12.4 Balancing Valves. Balancing valves shall be permitted to be used to obtain uniform flow distribution. Balancing valves shall be installed at the outlet of each group of collectors. Balancing valves shall be made of a bronze body

with a brass ball, plastic, or other types compatible with the heat transfer medium. Final settings shall be marked on each balancing valve in an approved manner.

S-12.5 **Accessible.** Required fullway or shutoff valves shall be accessible.

S-12.6 **Control Valves.** An approved three-way valve shall be permitted to be installed for manual control of solar thermal systems. An approved electric control valve shall be permitted to be installed for automatic control of solar thermal systems. The installation and operation of automatic control valves shall comply with the manufacturer's instructions.

S-12.7 **Check Valves.** An approved-type check valve shall be installed on liquid heat transfer piping where the solar energy system design is capable of allowing reverse thermosiphoning of heated liquids into the collector array.

S-12.8 **Automatic Air Vents.** Automatic air release vents shall be installed at high points of the solar thermal system in accordance with the system design requirements and manufacturer's installation instructions.

S-12.9 **Closed Loop Systems.** Closed loop systems, where hose bibbs or similar valves are used to charge or drain the system, shall be of loose key type; have valve outlets capped; or have handles removed where the system is operational.

S-13 **Piping and Cross-connection Control For Solar Thermal Systems.**

S-13.1 **Cross Connection Control.**

S-13.1.1 **Prohibited Installation.** No installation of solar thermal piping, or part thereof, shall be made in such a manner that it will be possible for used, unclean, polluted, or contaminated water, mixtures, or substances to enter a portion of the potable water system from a pipe, tank, receptor, or any other equipment by reason of backsiphonage, suction, or any other cause, either during normal use and operation thereof, or where such pipe, tank, receptor, or equipment is subject to pressure exceeding the operating pressure in the potable water system.

S-13.1.2 **Cross-Contamination.** No person shall make a connection or allow one to exist between pipes or conduits carrying potable water supplied by a public or private building supply system, and pipes or conduits containing or carrying water from other source or containing or carrying water that has been used for any purpose whatsoever, or piping carrying chemicals, liquids, gases, or substances unless there is provided a backflow prevention device approved for the potential hazard and maintained in accordance with this Code.

S-13.1.3 **Backflow Prevention.** No device or construction shall be installed or maintained, or shall be connected to a potable water supply, where such installation or connection provides a possibility of polluting such water supply or cross-connection between a distributing system of water for drinking and domestic purposes and water that becomes contaminated by such device or construction unless there is provided a backflow prevention device approved for the potential hazard. Backflow prevention devices shall comply with Sections 602 and 603 of this Code.

S-13.1.4 **Water Supply Inlets.** Water supply inlets to tanks and other receptors shall be protected by one of the following means:

- (1) An approved air gap.
- (2) A listed vacuum breaker installed on the discharge side of the last valve with the critical level not less than 6 inches (152 mm) or in accordance with its listing.
- (3) A backflow preventer suitable for the contamination or pollution, installed in accordance with the requirements for that type of device or assembly as set forth in this Code.

S-13.2 **Materials.**

S-13.2.1 **Piping Materials.** Piping materials shall comply with the applicable standards referenced in Table 604.1 and other provisions of this Code. Materials shall be rated for the operating temperature and pressures of the solar energy system and shall be compatible with the type of heat transfer medium and shall be approved for such use. Pipe fittings and valves shall be approved for the piping systems, and shall be compatible with, or shall be of the same material as the pipe or tubing. Exterior piping shall be protected from corrosion, degradation, and shall be resistant to UV radiation. Galvanized steel shall not be used in solar thermal systems where in contact with glycol heat transfer fluid.

S-13.2.2 **Screwed Fittings.** Screwed fittings shall be ABS, cast-iron, copper, copper alloy, malleable iron, PVC, steel, stainless steel or other approved materials. Threads shall be tapped out of solid metal or molded in solid ABS or PVC.

S-13.2.3 **Storage Tank Connectors.** Flexible metallic storage tank connectors or reinforced flexible storage tank connectors connecting a storage tank to the piping system shall be in accordance with the applicable standards (ASME A112.18.6-2009/CSA B 125.6-2009). Copper or stainless steel flexible connectors shall not exceed 24 inches (610 mm). PEX, PE-AL-PE, or PE-RT tubing shall not be installed within the first 18 inches (457 mm) of piping connected to a storage tank.

S-13.2.3.1 **Flexible Connectors.** Listed flexible connectors shall be installed in readily accessible locations, unless otherwise indicated in the listing.

S-13.3 **Safety Devices.**

S-13.3.1 **Pressure Relief Valves.** Solar energy system components containing pressurized fluids shall be protected against pressures exceeding design limitations with a pressure relief valve. Each section of the system in which excessive pressures are capable of developing shall have a relief device located so that a section cannot be isolated from a relief device. Valves shall not be located on either side of a relief valve connection. The relief valve discharge pipe shall be of approved material that is rated for the temperature of the system. The discharge pipe shall be the same diameter as the relief valve outlet and shall discharge by gravity through an air gap into the drainage system or outside of the building with the end of the pipe not exceeding 2 feet (610 mm) nor less than 6 inches (152 mm) above the ground and pointing downward.

S-13.3.2 Vacuum Relief Valves. The solar energy system components that are subjected to a vacuum while in operation or during shutdown shall be protected with vacuum relief valves. Where the piping configuration, equipment location, and valve outlets are located below the storage tank elevation the system shall be equipped with a vacuum relief valve at the highest point.

S-13.3.3 Space Heating. Where a combination potable water heating and space heating system requires water for space heating at temperatures higher than 140°F (60°C), a thermostatic mixing valve that is in accordance with ASSE 1017 shall be provided to limit the water supplied to the potable hot water distribution system to a temperature of 140°F (60°C) or less.

S-13.4 Protection of System Components.

S-13.4.1 Corrosion. Solar thermal systems and components subject to corrosion shall be protected in an approved manner. Metal parts exposed to atmospheric conditions shall be of corrosion-resistant material.

S-13.4.2 Mechanical Damage. Portions of a solar energy system installed where subjected to mechanical damage shall be guarded against such damage by being installed behind approved barriers or, where located within a garage, be elevated or located out of the normal path of a vehicle.

S-13.4.3 Freeze Protection. No solar thermal piping shall be installed or permitted outside of a building or in an exterior wall, unless, where necessary, adequate provision is made to protect such pipe from freezing. Freeze protection for solar thermal systems shall be provided in accordance with the following:

(1) Protection from freeze damage where the ambient temperature is less than 41°F (5°C) shall be provided for system components containing heat transfer liquids in an approved manner.

(2) The supplier of each system shall specify the limit ("Freeze Tolerance Limit") to the system's tolerance of freezing weather conditions.

(3) For systems that rely on manual intervention for freeze protection, the supplier shall specify the system's freeze tolerance limit based on exposure for 18 hours to a constant atmospheric temperature.

(4) For solar thermal systems where the collector fluid is potable water, not less than two freeze protection mechanisms shall be provided on each system. Manual intervention (e.g., draining, changing valve positions, etc.) shall be permitted as one mechanism. Not less than one freeze protection mechanism, in addition to manual intervention, shall be designed to protect components from freeze damage, in the event of power failure in an approved manner. Where approved, thermal mass of a system shall be permitted to be a form of freeze protection.

(5) Fittings, pipe slope, and collector shall be designed to allow for manual gravity draining and air filling of solar thermal system components and piping. Pipe slope for gravity draining shall be not less than $\frac{1}{4}$ inch per foot (20.8 mm/m) of horizontal length. This also applies to header pipes or absorber plate riser tubes internal to the collector. Where a means to drain the system is provided a drain valve shall be installed.

(6) At the time of installation, a label indicating the method of freeze protection for the system shall be attached to the system in a visible location. For systems which rely on manual intervention for freeze protection, such label shall indicate the minimum ambient temperature conditions (Freeze Tolerance Limit) below which owner action is recommended by the manufacturer's instructions.

S-13.4.4 Water Hammer Protection. Solar thermal systems where quick-acting valves are installed shall be provided with water hammer arrester(s) to absorb high pressures resulting from the quick closing of these valves. Water hammer arrestors shall be approved mechanical devices in accordance with the applicable standard(s) referenced in this Code and shall be installed as close as possible to quick-acting valves.

S-13.4.5 Materials. Solar thermal system components in contact with heat-transfer mediums shall be approved for such use. Solar thermal system components, installed outdoors, shall be resistant to UV radiation.

S-13.4.6 Heat Transfer Medium. Solar thermal piping shall be identified with an orange background with black uppercase lettering, with the words "CAUTION: HEAT TRANSFER MEDIUM, DO NOT DRINK." Each solar thermal system shall be identified to designate the medium being conveyed. The minimum size of the letters and length of the color field shall comply with Table S-13.4.6.

Each outlet on the solar thermal piping system shall be posted with black uppercase lettering as follows:

"CAUTION: HEAT TRANSFER MEDIUM, DO NOT DRINK."

TABLE S-13.4.6**Minimum Length of Color Field and Size of Letters**

Outside Diameter of Pipe or Covering (inches)	Minimum Length of Color Field (inches)	Minimum Size of Letters (inches)
$\frac{1}{2}$ to $1\frac{1}{4}$	8	$\frac{1}{2}$
$1\frac{1}{2}$ to 2	8	$\frac{3}{4}$
$2\frac{1}{2}$ to 6	12	$1\frac{1}{4}$
8 to 10	24	$2\frac{1}{2}$
Over 10	32	$3\frac{1}{2}$

For SI units: 1 inch = 25.4 mm

S-14 Specific Requirements.**S-14.1 Electrical.**

S-14.1.1 Wiring. Electrical connections, wiring, and devices shall be installed in accordance with the Los Angeles County Electrical Code. Electrical equipment, appliances, and devices installed in areas that contain flammable vapors or dusts shall be of a type approved for such environment.

S-14.1.2 Controls. Required electrical, mechanical, safety, and operating controls shall be listed or labeled by a listing agency. Electrical controls shall be of such design and construction as to be suitable for installation in the environment in which they are located.

S-14.2 Flow Directions. Solar thermal systems shall have flow directions indicated on system components and piping or shall have flow directions indicated on a diagrammatic representation of the system as installed, and permanently affixed to the system hardware in a readily visible location.

S-14.3 Attic Installations. An attic space in which solar energy system components are installed shall comply with Section 508.4 of this Code.

S-14.4 **Connections to Drainage System Required.** Receptors, drains, appurtenances, and appliances, used to receive or discharge liquid wastes, shall be connected to the drainage system of the building or premises in accordance with the requirements of this Code.

S-14.5 **Dry Storage Systems.**

S-14.5.1 **Waterproofing.** The containment structure for dry thermal storage systems shall be constructed in an approved manner to prevent the infiltration of water or moisture.

S-14.5.2 **Detecting Water Intrusion.** The containment structure shall be capable of fully containing spillage or moisture accumulation that occurs. The structure shall have a means, such as a sight glass, to detect spillage or moisture accumulation, and shall be fitted with a drainage device to eliminate spillage.

S-14.5.3 **Rock as Storage Material.** Systems utilizing rock as the thermal storage material shall use clean, washed rock that is free of organic material.

S-14.5.4 **Odor and Particulate Control.** Thermal storage materials and containment structures, including interior protective coating, shall not impart toxic elements, particulate matter, or odor to areas of human occupancy.

S-14.5.5 **Combustibles Within Ducts or Plenums.** Materials exposed within ducts or plenums shall be noncombustible or shall have a flame spread index not to exceed 25 and a smoke developed index not to exceed 50 where tested as a composite product in accordance with ASTM E 84 or UL 723.

S-15 **Solar Thermal Systems for Swimming Pool.**

S-15.1 **Applicability.** This Section applies to the installation and construction of solar thermal systems for swimming pools, spas, and hot tubs.

S-15.2 **Water Chemistry.** Where water from a swimming pool, spa or hot tub is heated by way of circulation through solar collectors, the chemistry of such water shall comply with the requirements of Section S-15.2 and Table S-15.2 and shall be filtered in accordance with Sections S-15.3 and S-15.3.1 of this Code.

TABLE S-15.2
WATER CHEMISTRY

PARAMETER	ACCEPTABLE RANGE
Calcium hardness	200 – 400 parts per million (ppm)
Langelier Saturation Index	0 (+ or - 0.3 acceptable)
pH	7.2 – 7.8
TDS	< 1500 ppm
Total alkalinity	80 – 120 ppm

For SI Units: 1 part per million = 1 mg/L.

S-15.3 **Filter.** A filter shall be provided to remove debris from the water entering the solar loop.

EXCEPTION: A solar swimming pool, spa, or hot tub heating system with a heat exchanger.

S-15.3.1 **Location.** A filter shall be located upstream of a pump used to direct water to solar collectors.

S-15.4 **Corrosion Resistant.** Glazed solar collectors made of copper shall not be used for solar pool, spa, or hot tub heating.

EXCEPTION: Where a heat exchanger is provided between the collector circuit and the swimming pool, spa, or hot tub water.

S-16 **Certificate of Compliance.** Upon completion of the solar

energy system, the permittee shall sign a Certificate of Compliance with this Code.

The Certificate of Compliance shall also list the following information:

- (1) Type of freeze protection;
- (2) Mixing valve setting degrees Fahrenheit (° F);
- (3) Subsystem working pressure (if applicable) psi;
- (4) Subsystem test pressure (if applicable) psi;
- (5) Heat exchange make and model number (if applicable);
- (6) Circulating pump over temperature protection shut-off setting degrees

Fahrenheit (° F) for one-tank systems where the water heater controls utilize fusible-link type over temperature protection.

This Certificate shall be posted in a conspicuous location at or near the water heater.

S-17 **Referenced Standards.** The standards listed in Table S-17

are intended for use in the design, testing, and installation of materials, devices, appliances, and equipment regulated by this Chapter.

TABLE S-17

REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION
ASCE 25-2006*	Earthquake Actuated Automatic Gas Shutoff Devices	Fuel Gas
ASHRAE 90.1-2010*	Energy Standard for Buildings Except Low-Rise Residential Buildings	Energy
ASHRAE 93-2010*	Methods of Testing to Determine the Thermal Performance of Solar Collectors	Testing
ASHRAE 95-1981*	Thermal Testing of 32 Residential Solar Water Heating Systems	Testing

STANDARD NUMBER	STANDARD TITLE	APPLICATION
ASHRAE 96-1980 (R1989)*	Thermal Performance of Unglazed Flat-Plate Liquid-Type Solar Collectors	Testing, Collector
ASME A13.1-2007*	Scheme for the Identification of Piping Systems	Piping
ASME A112.1.2-2004*	Air Gaps in Plumbing Systems (For Plumbing Fixtures and Water-Connected Receptors)	Fittings
ASME A112.1.3-2000 (R2010)*	Air Gap Fittings for Use with Plumbing Fixtures, Appliances, and Appurtenances	Fittings
ASME A112.18.1-2005/CSA B125.1-2005	Plumbing Supply Fittings	Fittings
ASME A112.18.2-2005/CSA B125.2-2005	Plumbing Waste Fittings	Fittings
ASME A112.18.6-2009/CSA B125.6-2009*	Flexible Water Connectors	Piping
ASME B1.20.1-1983 (R2006)*	Pipe Threads, General Purpose, Inch	Joints
ASME B16.3-2006*	Malleable-Iron Threaded Fittings: Classes 150 and 300	Fittings
ASME B16.4-2006*	Gray Iron Threaded Fittings (Classes 125 and 250)	Fittings
ASME B16.5-2009*	Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch	Fittings
ASME B16.12-2009*	Cast Iron Threaded Drainage Fittings	Fittings
ASME B16.15-2006*	Cast Copper Alloy Threaded Fittings: Classes 125 and 250	Fittings
ASME B16.18-2001 (R2005)*	Cast Copper Alloy Solder Joint Pressure Fittings	Fittings
ASME B16.21-2005*	Nonmetallic Flat Gaskets for Pipe Flanges	Joints
ASME B16.22-2001 (R2010)*	Wrought Copper and Copper Alloy Solder Joint Pressure Fittings	Fittings
ASME B16.23-2002 (R2006)*	Cast Copper Alloy Solder Joint Drainage Fittings: DWV	Fittings
ASME B16.24-2006*	Cast Copper Alloy Pipe Flanges and Flanged Fittings: Classes 150, 300, 600, 900, 1500 and 2500	Fittings
ASME B16.26-2006*	Cast Copper Alloy Fittings for Flared Copper Tubes	Fittings
ASME B16.29-2007*	Wrought Copper and Wrought Copper Alloy Solder-Joint Drainage Fittings-DWV	Fittings
ASME B16.33-2002 (R2007)*	Manually Operated Metallic Gas Valves for use in Gas Piping Systems up to 125 psi (Sizes NPS 1/2 – NPS 2)	Valves
ASME B16.34-2009*	Valves – Flanged, Threaded, and Welding End	Valves
ASME B16.47-2006*	Large Diameter Steel Flanges: NPS 26 Through NPS 60 Metric/Inch	Fittings
ASME BPVC Section IV-2010*	Rules for Construction of Heating Boilers	Miscellaneous
ASME BPVC Section VIII-2010*	Rules for Construction of Pressure Vessels Division 1	Miscellaneous
ASME BPVC Section IX-2010*	Welding and Brazing Qualifications	Certification
ASME BPVC Section X-2007*	Fiber-Reinforced Plastic Pressure Vessels	Pressure Vessel Construction, Pressure Vessels

STANDARD NUMBER	STANDARD TITLE	APPLICATION
ASME SA194-2010*	Carbon and Alloy Steel Nuts for Bolts for High-Pressure or High-Temperature Service or Both	Mounting
ASSE 1001-2008*	Atmospheric-Type Vacuum Breakers	Backflow Protection
ASSE 1002-2008*	Anti-Siphon Fill Valves for Water Closet Tanks	Backflow Protection
ASSE 1003-2009*	Water Pressure Reducing Valves for Domestic Water Distribution Systems	Valves
ASSE 1010-2004*	Water Hammer Arrestors	Water Supply Component
ASSE 1013-2009*	Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers	Backflow Protection
ASSE 1015-2009*	Double Check Backflow Prevention Assemblies and Double Check Fire Protection Backflow Prevention Assemblies	Backflow Protection
ASSE 1017-2009*	Temperature Actuated Mixing Valves for Hot Water Distribution Systems	Valves
ASSE 1018-2001*	Trap Seal Primer Valves—Potable Water Supplied	Valves
ASSE 1019-2004*	Vacuum Breaker Wall Hydrants, Freeze Resistant, Automatic Draining Type	Backflow Protection
ASSE 1020-2004*	Pressure Vacuum Breaker Assembly	Backflow Protection
ASSE 1022-2003*	Backflow Preventer for Beverage Dispensing Equipment	Backflow Protection
ASSE 1044-2001*	Trap Seal Primer Devices—Drainage Types and Electronic Design Types	DWV Components
ASSE 1047-2009*	Reduced Pressure Detector Fire Protection Backflow Prevention Assemblies	Backflow Protection
ASSE 1048-2009*	Double Check Detector Fire Protection Backflow Prevention Assemblies	Backflow Protection
ASSE 1052-2004*	Hose Connection Backflow Preventers	Backflow Protection
ASSE 1056-2001*	Spill Resistant Vacuum Breakers	Backflow Protection
ASSE 1061-2006*	Push-Fit Fittings	Fittings
ASSE 1079-2005	Dielectric Pipe Unions	Joints
ASSE Series 5000-2009*	Cross-Connection Control Professional Qualifications	Certification
ASTM A 53/A 53M-2010	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded, and Seamless	Piping, Ferrous
ASTM A 74-2009	Cast Iron Soil Pipe and Fittings	Piping, Ferrous
ASTM A 126-2004 (R2009)	Gray Iron Castings for Valves, Flanges, and Pipe Fittings	Piping, Ferrous
ASTM A 269-2010	Seamless and Welded Austenitic Stainless Steel Tubing for General Service	Piping, Ferrous
ASTM A 312-2009	Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes	Piping, Ferrous
ASTM A 377-2003 (R2008) ⁶¹	Ductile-Iron Pressure Pipe	Piping, Ferrous
ASTM A 518-1999 (R2008)	Corrosion-Resistant High-Silicon Iron Castings	Piping, Ferrous
ASTM A 733-2003 (R2009) ⁶¹	Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples	Piping, Ferrous
ASTM A 861-2004 (R2008)	High-Silicon Iron Pipe and Fittings (Note 1)	Piping, Ferrous
ASTM B 32-2008	Solder Metal (Note 2)	Joints
ASTM B 42-2010	Seamless Copper Pipe, Standard Sizes	Piping, Copper Alloy
ASTM B 43-2009	Seamless Red Brass Pipe, Standard Sizes	Piping, Copper Alloy
ASTM B 75-2002 (R2010)	Seamless Copper Tube	Piping, Copper Alloy
ASTM B 88-2009	Seamless Copper Water Tube	Piping, Copper Alloy

STANDARD NUMBER	STANDARD TITLE	APPLICATION
ASTM B 135-2010	Seamless Brass Tube	Piping, Copper Alloy
ASTM B 251-2010	General Requirements for Wrought Seamless Copper and Copper-Alloy Tube	Piping, Copper Alloy
ASTM B 302-2007	Threadless Copper Pipe, Standard Sizes	Piping, Copper Alloy
ASTM B 306-2009	Copper Drainage Tube (DWV)	Piping, Copper Alloy
ASTM B 447-2007	Welded Copper Tube	Piping, Copper Alloy
ASTM B 584-2009a	Copper Alloy Sand Castings for General Applications (Note 3)	Piping, Copper Alloy
ASTM B 587-2008	Welded Brass Tube	Piping, Copper Alloy
ASTM B 687-1999 (R2005) ^{e1}	Brass, Copper, and Chromium-Plated Pipe Nipples	Piping, Copper Alloy
ASTM B 813-2010	Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube	Joints
ASTM B 828-2002 (R2010)	Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings	Joints
ASTM C 296-2000 (R2009) ^{e1}	Asbestos-Cement Pressure Pipe	Piping, Non-Metallic
ASTM C 411-2005	Hot-Surface Performance of High-Temperature Thermal Insulation	Thermal Insulating Materials
ASTM C 425-2004 (R2009)	Compression Joints for Vitrified Clay Pipe and Fittings	Joints
ASTM C 443-2010	Joints for Concrete Pipe and Manholes, Using Rubber Gaskets	Joints
ASTM C 564-2009a	Rubber Gaskets for Cast Iron Soil Pipe and Fittings	Joints
ASTM C 700-2011	Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated	Piping, Non-Metallic
ASTM C 1277-2009a	Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings	Joints
ASTM D 56-2005*	Flash Point by the Tag Closed Cup Tester	Testing
ASTM D 93-2010a	Flash Point by Pensky-Martens Closed Cup Tester	Testing
ASTM D 635-2006	Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position	Testing
ASTM D 1785-2006*	Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120	Piping, Plastic
ASTM D 1869-1995 (R2010)	Rubber Rings for Asbestos-Cement Pipe	Joints
ASTM D 2235-2004 (R2011)*	Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings	Joints
ASTM D 2239-2003*	Polyethylene (PE) Plastic Pipe, (SDR-PR) Based on Controlled Inside Diameter	Piping, Plastic
ASTM D 2241-2009*	Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)	Piping, Plastic
ASTM D 2464-2006*	Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 (Note 1)	Fittings
ASTM D 2466-2006*	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40 (Note 1)	Fittings
ASTM D 2467-2006*	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 (Note 1)	Fittings
ASTM D 2513-2011*	Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings (Note 1)	Piping, Plastic
ASTM D 2564-2004 (R2009)*	Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems	Joints
ASTM D 2609-2002 (R2008)*	Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe (Note 1)	Fittings

STANDARD NUMBER	STANDARD TITLE	APPLICATION
ASTM D 2657-2007*	Heat Fusion Joining of Polyolefin Pipe and Fittings (Note 1)	Joints
ASTM D 2672-1996a (R2009)*	Joints for IPS PVC Pipe Using Solvent Cement	Joints
ASTM D 2683-2010*	Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing	Fittings
ASTM D 2737-2003*	Polyethylene (PE) Plastic Tubing	Piping, Plastic
ASTM D 2846-2009b*	Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems	Piping, Plastic
ASTM D 2855-1996 (R2010)*	Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings	Joints
ASTM D 3035-2010*	Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter	Piping, Plastic
ASTM D 3139-1998 (R2011)*	Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals	Joints
ASTM D 3261-2010a*	Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing	Fittings
ASTM D 3278-1996 (R2011)*	Flash Point of Liquids by Small Scale Closed-Cup Apparatus	Testing
ASTM E 84-2010b*	Surface Burning Characteristics of Building Materials	Miscellaneous
ASTM E 2231-2009	Specimen Preparation and Mounting of Pipe and Duct Insulation Materials to Assess Surface Burning Characteristics	Pipe Insulation
ASTM F 402-2005*	Safe Handling of Solvent Cements, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings	Joints
ASTM F 437-2009*	Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80	Fittings
ASTM F 438-2009*	Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40	Fittings
ASTM F 439-2009*	Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80	Fittings
ASTM F 441-2009*	Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80	Piping, Plastic
ASTM F 442-2009*	Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR)	Piping, Plastic
ASTM F 480-2006b ⁰¹ *	Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR), Schedule 40 and Schedule 80	Piping, Plastic
ASTM F 493-2010*	Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings	Joints
ASTM F 628-2008*	Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe with a Cellular Core (Note 1)	Piping, Plastic
ASTM F 656-2010*	Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings	Joints
ASTM F 876-2010*	Crosslinked Polyethylene (PEX) Tubing	Piping, Plastic
ASTM F 877-2007*	Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems	Piping, Plastic

STANDARD NUMBER	STANDARD TITLE	APPLICATION
ASTM F 891-2010*	Coextruded Poly (Vinyl Chloride) (PVC) Plastic Pipe with a Cellular Core	Piping, Plastic
ASTM F 1055-1998 (R2006)*	Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing	Fittings
ASTM F 1281-2007*	Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Pressure Pipe	Piping, Plastic
ASTM F 1282-2010*	Polyethylene/Aluminum Polyethylene (PE-AL-PE) Composite Pressure Pipe	Piping, Plastic
ASTM F 1807-2010 ⁶¹ *	Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing	Fittings
ASTM F 1960-2010*	Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing	Fittings
ASTM F 1961-2009*	Metal Mechanical Cold Flare Compression Fittings with Disc Spring for Crosslinked Polyethylene (PEX) Tubing	Fittings
ASTM F 1970-2005*	Special Engineered Fittings, Appurtenances or Valves for Use in Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Systems	Piping, Plastic
ASTM F 1974-2009*	Metal Insert Fittings for Polyethylene/Aluminum Polyethylene and Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene Composite Pressure Pipe	Fittings
ASTM F 2080-2009*	Cold-Expansion Fittings with Metal Compression Sleeves for Crosslinked Polyethylene (PEX) Pipe	Fittings
ASTM F 2098-2008*	Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing to Metal Insert and Plastic Insert Fittings	Joints
ASTM F 2159-2010*	Plastic Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing	Joints
ASTM F 2262-2009*	Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene Tubing OD Controlled SDR9	Piping, Plastic
ASTM F 2389-2010	Pressure-Rated Polypropylene (PP) Piping Systems	Piping, Plastic
ASTM F 2434-2009*	Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Tubing	Pipe Fittings
ASTM F 2735-2009	Plastic Insert Fittings for SDR9 Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing	Fittings
ASTM F 2769-2009	Polyethylene of Raised Temperature (PE-RT) Plastic Hot and Cold-Water Tubing and Distribution Systems	Piping and Fittings, Plastic
AWS A5.8-2004*	Filler Metals for Brazing and Braze Welding	Joints

STANDARD NUMBER	STANDARD TITLE	APPLICATION
AWS A5.9-2006*	Bare Stainless Steel Welding Electrodes and Rods	Joints
AWS B2.2-2010*	Brazing Procedure and Performance Qualification	Certification
AWWA C110-2008*	Ductile-Iron and Gray-Iron Fittings	Fittings
AWWA C111-2007*	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings (same as ANSI A 21.11)	Joints
AWWA C151-2009*	Ductile-Iron Pipe, Centrifugally Cast	Piping, Ferrous
AWWA C153-2006*	Ductile-Iron Compact Fittings for Water Service	Fittings
AWWA C203-2008*	Coal-Tar Protective Coatings and Linings for Steel Water Pipelines -Enamel and Tape -Hot Applied	Miscellaneous
AWWA C213-2007*	Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines	Miscellaneous
AWWA C215-2010*	Extruded Polyolefin Coatings for the Exterior of Steel Water Pipelines	Miscellaneous
AWWA C500-2009*	Metal-Seated Gate Valves for Water Supply Service	Valves
AWWA C507-2005*	Ball Valves, 6 in. through 48 in. (150 mm through 1200 mm)	Valves
AWWA C510-2007*	Double Check Valve Backflow Prevention Assembly	Backflow Protection
AWWA C511-2007*	Reduced-Pressure Principle Backflow Prevention Assembly	Backflow Protection
AWWA C900-2007*	Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 in. through 12 in. (100 mm through 300 mm), for Water Transmission and Distribution	Piping, Plastic
AWWA C901-2008*	Polyethylene (PE) Pressure Pipe and Tubing, 1/2 in. (13 mm) through 3 in. (76 mm), for Water Service	Piping, Plastic
AWWA C 904-2006*	Cross-linked Polyethylene (PEX) Pressure Pipe, 1/2 in. (12 mm) through 3 in. (76 mm), for Water Service	Piping, Plastic
BS EN 12975-1-2006	Thermal Solar Systems and Components – Solar Collectors (Part 1: General Requirements)	Collector
BS EN 12975-2-2006	Thermal Solar Systems and Components – Solar Collectors (Part 2: Test Methods)	Collector
BS EN 12976-1-2006	Thermal Solar Systems and Components – Factory Made Systems (Part 1: General Requirements)	Solar System
BS EN 12976-2-2006	Thermal Solar Systems and Components – Factory Made Systems (Part 2: Test Methods)	Solar System
BS EN ISO 9488-2000	Solar Energy – Vocabulary	Miscellaneous
CSA B64.1.1-2007	Atmospheric Vacuum Breakers (AVB)	Backflow Protection
CSA B64.1.2-2007	Pressure Vacuum Breakers (PVB)	Backflow Protection
CSA B64.2.1.1-2007	Hose Connection Dual Check Vacuum Breakers (HCDVB)	Backflow Protection
CSA B64.4-2007	Reduced Pressure Principle (RP) Backflow Preventers	Backflow Protection
CSA B64.4.1-2007	Reduced Pressure Principle Backflow Preventers for Fire Protection Systems (RPF)	Backflow Protection

STANDARD NUMBER	STANDARD TITLE	APPLICATION
CSA B64.5-2007	Double Check Valve (DVCA) Backflow Preventers	Backflow Protection
CSA B64.5.1-2007	Double Check Valve Backflow Preventers for Fire Protection Systems (DVCAF)	Backflow Protection
CSA B137.1-2009	Polyethylene (PE) Pipe, Tubing, and Fittings for Cold-Water Pressure Services	Piping, Plastic
CSA B137.5-2009	Crosslinked Polyethylene (PEX) Tubing Systems for Pressure Applications	Piping, Plastic
CSA B137.9-2009	Polyethylene/Aluminum Polyethylene (PE-AL-PE) Composite Pressure-Pipe Systems	Piping, Plastic
CSA B137.10-2009	Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Composite Pressure-Pipe Systems	Piping, Plastic
CSA B137.11-2009	Polypropylene (PP-R) Pipe and Fittings for Pressure Applications	Piping, Plastic
CSA Z21.10.1a-2009*	Gas Water Heaters -Volume I, Storage Water Heaters with Input Ratings of 75 000 Btu Per Hour or Less (same as CSA 4.1a)	Fuel Gas, Appliances
CSA Z21.10.3b-2008 (R2010)*	Gas Water Heaters -Volume III, Storage Water Heaters with Input Ratings Above 75 000 Btu Per Hour, Circulating and Instantaneous (same as CSA 4.3b)	Fuel Gas, Appliances
CSA Z21.13a-2010*	Gas-Fired Low-Pressure Steam and Hot Water Boiler (same as CSA 4.9a)	Fuel Gas, Appliances
CSA Z21.22b-2001 (R2008)*	Relief Valves for Hot Water Supply Systems (same as CSA 4.4b)	Valves
CSA Z21.24a-2009*	Connectors for Gas Appliances (same as CSA 6.10a)	Fuel Gas
CSA Z21.56a-2008*	Gas-Fired Pool Heaters (same as CSA 4.7a)	Fuel Gas, Swimming Pools and Spas, and Hot Tubs
DD ENV 12977-1-2001	Thermal Solar Systems and Components – Custom Built Systems (Part 1: General Requirements)	Solar System
DD ENV 12977-2-2001	Thermal Solar Systems and Components – Custom Built Systems (Part 2: Test Methods)	Solar System
DD ENV 12977-3-2001	Thermal Solar Systems and Components – Custom Built Systems (Part 3: Performance Characterization of Stores for Solar Heating Systems)	Solar System
IAPMO IS 8-2006	PVC Cold Water Building Supply and Yard Piping	Piping, Plastic
IAPMO IS 13-2006	Protectively Coated Pipe	Pipe Coatings
IAPMO IS 20-2010	CPVC Solvent Cemented Hot and Cold Water Distribution Systems	Piping, Plastic
IAPMO PS 25-2002	Metallic Fittings for Joining Polyethylene Pipe for Water Service and Yard Piping	Joints
IAPMO PS 64-2007a	Pipe Flashings	Miscellaneous
IAPMO PS 72-2007	Valves with Atmospheric Vacuum Breakers	Valves
IAPMO PS-117-2008	Copper and Copper Alloy Tubing System Incorporating Press-Type or Nail-Type Connections	Fittings
IEEE 937-2007	Installation and Maintenance of Lead-Acid Batteries for Photovoltaic (PV) Systems	Installation and Maintenance, Photovoltaic
IEEE 1013-2007	Sizing Lead-Acid Batteries for Stand-Alone Photovoltaic (PV) Systems	Photovoltaic, Sizing

STANDARD NUMBER	STANDARD TITLE	APPLICATION
IEEE 1361-2003	Lead-Acid Batteries Used in Stand-Alone Photovoltaic (PV) Systems	Testing, Evaluation
IEEE 1526-2003	Testing the Performance of Stand-Alone Photovoltaic Systems	Testing, Photovoltaic
IEEE 1547-2003	Interconnecting Distributed Resources with Electric Power Systems	Connections, Photovoltaic
IEEE 1562-2007	Array and Battery Sizing in Stand-Alone Photovoltaic (PV) Systems	Array, Battery, Photovoltaic
IEEE 1661-2007	Lead-Acid Batteries Used in Photovoltaic (PV) Hybrid Power Systems	Testing and Evaluation, Photovoltaic
ISO 9459-1-1993	Solar Heating – Domestic Water Heating Systems – Part 1	Solar System
ISO 9459-2-1995	Solar Heating – Domestic Water Heating Systems	Solar System
ISO 9806-1-1994	Test Methods for Solar Collectors – Part 1	Collector
ISO 9806-2-1995	Test Methods for Solar Collectors – Part 2	Collector
ISO 9806-3-1995	Test Methods for Solar Collectors – Part 3	Collector
ISO TR 10217-1989	Solar Energy – Water Heating Systems – Guide to Material Selection with Regard to Internal Corrosion	Solar System
MSS SP-58-2009	Pipe Hangers and Supports – Materials, Design, Manufacture, Selection, Application, and Installation	Fuel Gas
MSS SP-80-2008*	Bronze Gate, Globe, Angle, and Check Valves	Valves
NFPA 70-2011*	National Electrical Code	Electrical
NFPA 274-2009*	Test Method to Evaluate Fire Performance Characteristics of Pipe Insulation	Pipe Insulation
NSF 14-2010*	Plastic Piping System Components and Related Materials	Piping, Plastic
NSF 61-2010a*	Drinking Water System Components – Health Effects	Water Supply Components
SAE J512-1997	Automotive Tube Fittings	Fittings
SRCC 100-2005	Operating Guidelines for Certifying Solar Collectors	Collectors
SRCC 150-2008	Test Methods and Minimum Standards for Certifying Innovative Solar Collectors	Testing
SRCC 300-2008	Operating Guidelines and Minimum Standards for Certifying Solar Water Heating Systems	Solar System
UL 174-2004*	Household Electric Storage Tank Water Heaters (with revisions through April 22, 2009)	Appliances
UL 723-2008*	Test for Surface Burning Characteristics of Building Materials (with revisions through September 13, 2010)	Miscellaneous
UL 778-2010*	Motor-Operated Water Pumps (with revisions through August 25, 2011)	Pumps
UL 873-2007	Temperature-Indicating and -Regulating Equipment (with revisions through January 6, 2010)	Electrical
UL 916-2007	Energy Management Equipment (with revisions through June 4, 2010)	Electrical
UL 969-1995*	Safety Marking and Labeling System (with revisions through November 24, 2008)	Marking, Labeling
UL 1279-2010	Outline of Investigation for Solar Collectors	Electrical

STANDARD NUMBER	STANDARD TITLE	APPLICATION
UL 1453-2004*		
	Electric Booster and Commercial Storage Tank Water Heaters (with revisions through December 4, 2009)	Appliances
UL 1703-2002*	Flat-Plate Photovoltaic Modules and Panels (with revisions through May 23, 2011)	Electrical
UL 1741-2010	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources	Electrical
UL 4703-2010	Outline of Investigation for Photovoltaic Wire	Electrical
UL 6703 -2010	Outline for Connectors for Use in Photovoltaic Systems	Electrical
UL 8703-2008	Outline for Concentrator Photovoltaic Modules and Assemblies	Electrical
UL 60730-1A-2002	Automatic Electrical Controls for Household and Similar Use, Part 1: General Requirements	Electrical

* ANSI designated as an American National Standard.

Notes:

- 1 Although this standard is referenced in Table S-17, some of the pipe, tubing, fittings, valves, or fixtures included in the standard are not acceptable for use under the provisions of the Uniform Plumbing Code.
- 2 See Section 605.3.4 and Section 705.5.3 for restrictions.
- 3 Alloy C85200 for cleanout plugs.
- 4 Standards for materials, equipment, joints and connections. Where more than one standard has been listed for the same material or method, the relevant portions of all such standards shall apply.

S-17.1 Abbreviations in Table S-17.

ANSI American National Standards Institute, Inc., 25 W. 43rd Street, 4th Floor,
New York, NY 10036.

ASCE American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston,
VA 20191-4400.

ASHRAE American Society of Heating, Refrigerating and Air Conditioning
Engineers, Inc., 1791 Tullie Circle, NE, Atlanta, GA 30329-2305.

ASME American Society of Mechanical Engineers, Three Park Avenue, New
York, NY 10016-5990.

- ASSE** American Society of Sanitary Engineering, 901 Canterbury, Suite A,
Westlake, Ohio 44145.
- ASTM** American Society for Testing and Materials, 100 Barr Harbor Drive, West
Conshohocken, PA 19428-2959.
- AWS** American Welding Society, 550 NW LeJeune Road, Miami, FL, 33126.
- AWWA** American Water Works Association, 6666 W. Quincy Avenue, Denver, CO
80235.
- BSI (BS EN)** British Standard International, 389 Chiswick High Road, London, W4 4AL
United Kingdom.
- CSA** Canadian Standards Association, 5060 Spectrum Way, Suite 100,
Mississauga, Ontario, Canada, L4W 5N6.
- IAPMO** International Association of Plumbing and Mechanical Officials, 5001 E.
Philadelphia Street, Ontario, CA 91761-2816.
- IEEE** The Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane,
Piscataway, NJ 08854.
- ISO** International Organization for Standardization, 1 ch. de la Voie-Creuse,
Casa Postale 56, CH-1211 Geneva 20, Switzerland.

- MSS** Manufacturers Standardization Society of the Valve and Fittings Industry,
127 Park Street, NE, Vienna, VA 22180.
- NFPA** National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101,
Quincy, MA 02169-7471.
- NSF** NSF International, 789 Dixboro Road, Ann Arbor, MI 48113-0140.
- SAE** Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale,
PA 15096.
- SRCC** Solar Rating and Certification Corporation, 400 High Point Drive, Suite
400, Cocoa, FL 32926.
- UL** Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL
60062-2096.

SECTION 23. The provisions of this ordinance contain various changes, modifications, and additions to the 2013 Edition of the California Plumbing Code. Some of these changes are administrative in nature in that they do not constitute changes or modifications to requirements contained in the building standards published in the California Building Standards Code.

Pursuant to California Health and Safety Code sections 17958.5, 17958.7, and 18941.5, the Board of Supervisors hereby expressly finds that all of the changes and modifications to requirements contained in the building standards published in the California Building Standards Code contained in this ordinance, which are not

administrative in nature, are reasonably necessary because of local climatic, geological, or topographical conditions in the County of Los Angeles as more particularly described in the table set forth below.

PLUMBING CODE AMENDMENTS

CODE SECTION	CONDITION	EXPLANATION
721.3	Geological Topographical	To allow for the proper operation of existing Los Angeles County sewer infrastructure and establish consistency with Title 20 – Utilities of the Los Angeles County Code, Division 2 (Sanitary Sewers and Industrial Waste) due to local soil conditions and topography.
728.1 to 728.6	Geological Topographical	To allow for the proper operation of existing Los Angeles County sewer infrastructure and establish consistency with Title 20 – Utilities of the Los Angeles County Code, Division 2 (Sanitary Sewers and Industrial Waste) due to local soil conditions and topography.
Table H 1.7	Geological, Topographical,	To establish more restrictive requirements for protection of local groundwater due to local soil conditions.
Table H 2.1(1)	Geological, Topographical	To establish more restrictive requirements for protection of local groundwater due to local soil conditions, sewer capacity, and sewage treatment.
Table H 2.1(2)	Geological, Topographical	To establish consistency with requirements of the County Health Department for sewer capacity and sewage treatment due to local soil conditions.
Table H 2.1(3)	Geological, Topographical	To establish consistency with requirements of the County Health Department for sewer capacity and sewage treatment due to local soil conditions.
Section H 3.1	Geological, Topographical,	To establish more restrictive requirements for protection of local groundwater due to local soil conditions.

CODE SECTION	CONDITION	EXPLANATION
Section H 4.3	Geological, Topographical	To establish more restrictive requirements for protection of local groundwater due to local soil conditions.
Section H 6.5	Geological, Topographical	To establish more restrictive requirements for protection of local groundwater due to local soil conditions.
Section H 6.8	Geological, Topographical	To establish more restrictive requirements for protection of local groundwater due to local soil conditions.
Section H 7.2	Geological, Topographical	To establish more restrictive requirements for protection of local groundwater due to local soil conditions.
Section H 10.1	Geological	To establish more restrictive requirements to prevent earth movement based on local soil and seismic conditions.
Section H 11.6	Geological	To establish more restrictive requirements to prevent earth movement based on local soil and seismic conditions.

SECTION 24. This ordinance shall become operative on January 1, 2014.

[TITLE282013CSCC]

SECTION 25. This ordinance shall be published in The Daily Commerce a newspaper printed and published in the County of Los Angeles.



Mark Ridley-Thomas
Chairman

ATTEST:

Sachi A. Hamai
Sachi A. Hamai
Executive Officer -
Clerk of the Board of Supervisors
County of Los Angeles

I hereby certify that at its meeting of November 26, 2013 the foregoing ordinance was adopted by the Board of Supervisors of said County of Los Angeles by the following vote, to wit:

Ayes
Supervisors Gloria Molina
Mark Ridley-Thomas
Zev Yaroslavsky
Don Knabe
Michael D. Antonovich

Noes
Supervisors None

Effective Date: _____

Operative Date: January 1, 2014

Sachi A. Hamai
Sachi A. Hamai
Executive Officer -
Clerk of the Board of Supervisors
County of Los Angeles

I hereby certify that pursuant to
Section 25103 of the Government Code,
delivery of this document has been made:

SACHI A. HAMAI
Executive Officer
Clerk of the Board of Supervisors

By [Signature]
Deputy



APPROVED AS TO FORM:
JOHN F. KRATTLI
County Counsel

By [Signature]
Richard D. Weiss
Chief Deputy County Counsel